RESULTS BASED PERSONALIZATION OF ADVERTISEMENTS IN A SEARCH ENGINE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation in part of U.S. application Ser. No. 10/676,711, entitled "PERSONALIZATION OF WEB SEARCH". This application is also related to U.S. application Ser. No. 10/314,427, entitled "METHOD AND APPARATUS FOR SERVING RELEVANT ADVERTISEMENTS" (herein, "Relevant Advertisements Application"), to U.S. application Ser. No. 10/676,571, entitled "METHOD AND APPARATUS FOR CHARACTERIZING DOCUMENTS BASED ON CLUSTERS OF RELATED WORDS," (herein, "Clusters of Related Words Application"), and to U.S. application Ser. No. 10/646,331, entitled "IMPROVED METHODS FOR RANKING NODES IN LARGE DIRECTED GRAPHS," (herein "Ranking Nodes Application"). All of the above-identified applications are commonly owned with the instant application, and are incorporated by reference herein.

FIELD OF INVENTION

[0002] This invention relates in general to providing advertisements to users of online search engines.

BACKGROUND OF INVENTION

[0003] The current state of the art in online search engines is highly advanced in its ability to retrieve documents that are responsive to the terms of a query. The infeasibility of charging users for each search has lead search engine providers to rely on revenue from advertisers in order to fund the search services. Advertisements have historically been placed on various parts of the search engine interface, including as banner ads, and paid inclusion links, and sidebar ads. These advertisements are typically selected in response to the particular terms of the user's query. The underlying assumption of this model is that the query terms reflect the user's interests, and thus selecting advertisements based on the query terms should yield advertisements for products or services the match these interests. Of course, advertisers generally desire to provide ads to those users who would be interested in their products or services. Thus, if the user's query is "MP3 players", then the assumption is that the user is interested in learning about, and potentially purchasing an MP3 player, and hence an advertisement for a particular MP3 player may result in the user's purchase. The current state of the art for such advertisements is the use of pay-for-performance advertisements, in which the advertiser pays the search engine provider for placement of the advertisement on the search results page only if the user selects (clicks on or activates) the advertisement.

[0004] The problem with query driven advertisements is in the underlying assumption that the current query best expresses the user's interests. This assumption is made because the query is the only information that the search engine has about the user, and thus the only basis on which to determine the user's interests. However, a query is only a very transient and unreliable indicator of a user's underlying interests. A user may search for all manner of information, and much of the time this may be for business, technical, scientific or other information entirely unrelated to the user's actual personal interests, which the advertiser is typically trying to reach.

[0005] Thus, there is a need for a mechanism by which search engine providers can target advertisements on their search engines the personal interests of a user.

SUMMARY OF THE INVENTION

[0006] An advertisement serving system and methodology provides advertisements that are personalized to the interests of user in conjunction with the search results. Generally, the methodology includes selecting a set of documents responsive to a user query and a user profile containing user interest information, and then selecting one or more advertisements in response to a search profile derived from the set of documents. Because the set of documents are response to both the user query and to the user profile, they are thus personalized to the user's interests. The advertisements that are selected are also personalized because they are selected in response to a search profile derived from these personalized documents.

[0007] More specifically, in one embodiment, a user provides a search query to the system to search for documents relevant to the query. The system obtains a profile of the user that expresses the interests of the user. The user's interests may be expressed as terms, categories, or links, or any combination thereof. The user profile information is derived from any of prior searches by the user, prior search results, user activities in interacting with prior search results, user demographic, geographic, or psychographic information, expressed topic or category preferences, and web-sites associated with the user. The system executes the search query to obtain a set of relevant documents, and then uses the user profile to personalize the documents by reranking the documents in a manner that reflects their relevance to the user's profile. The personalized search results are then analyzed to further determine a search profile, such as key words or topics that are descriptive of the documents therein. The search profile is used to select one or more advertisements, which advertisements will thus be relevant to the user's interests. The selected advertisements and the personalized search results are combined and provided to the user.

[0008] In one aspect, a system in accordance with the present invention includes a search engine that processes a user's query to provide the search results, a personalization server that personalizes the search results based on the user's profile, a content analysis module that analyses the personalized search results to derive a search profile, and an advertisement server that selects one or more advertisements in response to the search profile.

[0009] The invention also has embodiments in computer program products, systems, user interfaces, and computer implemented methods for facilitating the described functions and behaviors.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] **FIG. 1** is a block diagram of system for providing results based personalized advertisements in accordance with one embodiment of the invention.

[0011] **FIG. 2** illustrates multiple sources of user information and their relationship to a user profile.

[0012] **FIG. 3** is an exemplary data structure that may be used for storing term-based profiles for a plurality of users.